

SECTION I—CLAIMS

Amendment to the Claims:

This listing of the claims will replace all prior versions and listings of claims in the application. No claims are amended. Claims 1-29 remain canceled herein without prejudice. No new claims are added.

Listing of Claims:

1-29. (Canceled)

30. (Previously Presented) A method comprising:

receiving content for transmission from a plurality of more than two transmit antennae, wherein

the received content is a vector of input symbols (\mathbf{s}) of size $N_c \times 1$, wherein N_c is the number of subcarriers of the multicarrier wireless communication channel; and

generating a rate-one, space-frequency code matrix from the received content for transmission

via the plurality of more than two transmit antennae by dividing the vector of input

symbols into a number G of groups to generate subgroups and multiplying at least a

subset of the subgroups by a constellation rotation precoder to produce a number G of

pre-coded vectors (\mathbf{v}_g), wherein successive symbols from the same group transmitted

from the same antenna are at a frequency distance that is multiples of N_G subcarrier spacings.

31. (Previously Presented) A method according to claim 30, further comprising:

dividing each of the pre-coded vectors into a number of $LM \times 1$ subvectors; and

creating an $M \times M$ diagonal matrix $D_{\mathbf{s}_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$, where $k=1 \dots L$ from

the subvectors.

32. (Previously Presented) A method according to claim 31, further comprising:

interleaving the L submatrices from the G groups to generate an $M \times N_c$ space-frequency matrix.

33. (Previously Presented) A method according to claim 32, wherein the space-frequency matrix provides $M N L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .

34. (Previously Presented) A method according to claim 30, wherein the space-frequency matrix provides $M N L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .

35. (Previously Presented) An apparatus comprising:

a diversity agent to receive content for transmission via a multicarrier wireless communication channel, wherein the received content is a vector of input symbols (\mathbf{s}) of size $N_c \times 1$, wherein N_c is the number of subcarriers of the multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from a plurality of more than two transmit antennae by dividing the vector of input symbols into a number G of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number G of pre-coded vectors (\mathbf{v}_g), wherein successive symbols from the same group transmitted from the same antenna are at a frequency distance that is multiples of N_G subcarrier spacings.

36. (Previously Presented) An apparatus according to claim 35, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the

pre-coded vectors into a number of $LM \times L$ subvectors, and to create an $M \times M$ diagonal matrix $D_{s_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$, where $k=1 \dots L$ from the subvectors.

37. (Previously Presented) An apparatus according to claim 36, wherein the space-frequency encoding element interleaves the L submatrices from the G groups to generate an $M \times Nc$ space-frequency matrix.
38. (Previously Presented) An apparatus according to claim 37, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .
39. (Previously Presented) An apparatus according to claim 35, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .
40. (Previously Presented) A system comprising:
 - a number M of omnidirectional antennas, wherein M comprises more than two omnidirectional antennas; and
 - a diversity agent, to receive content for transmission via a multicarrier wireless communication channel, wherein the received content is a vector of input symbols (\mathbf{s}) of size $Nc \times 1$, wherein Nc is the number of subcarriers of the multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from at least a subset of the M omnidirectional antennas by dividing the vector of input symbols into a number G of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number G of pre-coded vectors (\mathbf{v}_g), wherein successive symbols from the same group transmitted from the same

antenna are at a frequency distance that is multiples of NG subcarrier spacings.

41. (Previously Presented) A system according to claim 40, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of $LM \times 1$ subvectors, and to create an $M \times M$ diagonal matrix $D_{s_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$, where $k=1 \dots L$ from the subvectors.

42. (Previously Presented) A system according to claim 41, wherein the space-frequency encoding element interleaves the L submatrices from the G groups to generate an $M \times Nc$ space-frequency matrix.

43. (Previously Presented) A system according to claim 42, wherein the space-frequency matrix provides $M N L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .

44. (Previously Presented) A system according to claim 40, wherein the space-frequency matrix provides $M N L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .